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Maine Agricultural Experiment Station

BULLETIN No. 64. JUNE, 1900

POULTRY EXPERIMENTS IN 1899.

This Bulletin contains an account of experiments in fattening chickens for market and the egg record of the breeding pens for 1899.

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AGRICULTURAL EXPERIMENT STATION,
Orono, Maine.

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FEEDING CHICKENS FOR GROWTH.

G. M. Gowell.

COOPS VS. YARDS.

This study was undertaken to compare the rapidity of growth of chickens confined in small coops vs. chickens kept in sheds and small yards.

Ten coops, each with a floor space sixteen by twenty-three inches, were constructed of laths with close end partitions of boards. The floors were of laths placed three-fourths of an inch apart and one inch from the walls, so that they might be kept clean by the moving about of the birds. The coops were made two together without cutting the laths. The laths ran lengthwise of the coops on bottom, top and back, but on the front they were placed upright, and two inches apart so that the chickens could feed through between them readily. V-shaped troughs with three-inch sides were placed in front of and about two inches above the level of the floors of the coops.

These coops are of about the same size and form as those used by the English and French chicken fatteners who make a specialty of the business, fattening many thousands each year. They were located in the light, airy, cemented basement of the barn where they were free from disturbance, and the variations of temperature were not great.

The chickens used in the test were raised under similar conditions and from the same hatch. They were one hundred and thirty days old at the commencement of the test and all were pure blooded Barred Plymouth Rocks, White Wyandottes, or the Eaton strain of Light Weight Light Brahmas.

Four chickens were placed in each coop and fed on thick raw porridge, made by mixing meal with cold skimmed-milk, making it thick enough so it would drop and not run from the end of a wooden spoon.

The meal mixture employed was made up by mixing 100 pounds corn meal, 80 pounds wheat middlings, 50 pounds fine ground oats, and 40 pounds of fine animal meal. They were fed all of the porridge they would eat, twice each day. The troughs were removed and cleaned in half an hour after the commencement of each meal. They were constantly supplied with water.

Feeding was commenced August 24th and continued until September 28th—thirty-five days. The birds were weighed at the end of each week, at the same hour so that they might be equally empty of food at each weighing.

They consumed 477 pounds of meal and 84 gallons of skimmed milk. The forty chickens weighed at the commencement of the test 147.9 pounds and at its close 237.1 pounds and had gained 89.2 pounds, an average of 2.23 pounds per chicken live weight. The quantity of the dry meal required to produce a pound of gain was 5.94 pounds.

On the day that the feeding of the cooped birds was commenced, twenty of their mates were put in a house nine by eleven feet in size, with an attached yard twenty feet square. The yard was entirely bare of anything that would serve as green food.

They were fed, during the thirty-five days, on the same grain mixture with milk, as those confined in the small coops. The twenty birds weighed at the commencement of the test 66.6 pounds and at the close 116.0 pounds, making a gain of 49.4 pounds; an average of 2.47 pounds to each. The quantity of the dry meal required to produce a pound of gain was 5.52 pounds. In these tests greater total and individual gains and cheaper flesh productions were secured from the birds with partial liberty than from those in close confinement. The labor was less in caring for the yarded birds. The cooped birds were very quiet and did not appear to suffer from confinement.

When dressed, all of the carcasses in both lots were even, well-formed and handsome. The results indicate that there is no advantage in close confinement, but that rather greater gains and cheaper production result from partial liberty. That our success with the small coops was as good as that of the foreigners is shown by the reports of the English and Canadian fatteners. In another test made for the purpose of noting the effects of age, on the development and fleshing of chickens, as detailed beyond, it was incidentally shown that there is no advantage in very close confinement.

The tables which follow give the details of the experiments.

CHICKENS CLOSELY CONFINED IN COOPS AND FED THIRTY-FOUR DAYS

AGE OF CHICKENS AT COMMENCEMENT OF TEST—130 DAYS.

Coop.	Chickens.	Live Weights During Experiment.								Dressed weight.
		Aug. 24.	Aug. 31.	Sept. 7.	Sept. 14.	Sept. 21.	Sept. 28.	Increase.		
								Lot.	Each.	
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
1	4 Plymouth Rocks ..	12.2	14.9	17.3	19.1	21.7	22.8	10.6	2.65	16.5
2	4 Plymouth Rocks ..	14.2	16.1	18.0	20.4	22.7	23.9	9.7	2.42	17.8
3	4 Plymouth Rocks ..	16.0	18.0	20.1	22.2	24.3	25.4	9.4	2.35	19.5
4	4 Plymouth Rocks ..	15.4	17.9	19.8	22.0	24.2	24.9	9.5	2.37	19.7
5	4 Plymouth Rocks ..	14.5	16.8	18.8	20.3	22.8	23.7	9.2	2.30	18.4
6	4 Plymouth Rocks ..	13.4	15.0	17.1	18.6	20.7	22.0	8.6	2.15	16.4
7	4 Plymouth Rocks ..	16.2	18.2	20.1	21.8	23.8	24.2	8.0	2.00	19.8
8	4 White Wyandottes	14.8	16.7	18.8	19.9	21.6	22.3	7.5	1.87	16.8
9	4 Brahmas	16.4	19.2	21.3	22.6	24.4	25.5	9.1	2.27	19.0
10	4 White Wyandottes	14.8	17.2	19.0	20.3	21.7	22.4	7.6	1.90	16.8
	Total weights ...	147.9	170.0	190.3	207.1	227.9	237.1	......	......	180.7
	Increase in weight..	....	22.1	20.3	16.8	20.8	9.2	89.2	2.23	......

Pounds of grain mixture required to produce a pound of gain 5.94.

TWENTY CHICKENS (FOURTEEN PLYMOUTH ROCKS, FOUR WHITE WYANDOTTES, TWO BRAHMAS) CONFINED IN HOUSE AND SMALL YARD AND FED THIRTY-FIVE DAYS.

AGE OF CHICKENS AT COMMENCEMENT OF TEST—130 DAYS.

Live Weight.				Total dressed weights.
August 24.	September 28.	Increase in weights.		
		Total.	Each.	
Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
66.6	116.0	49.4	2.47	92.0

Pounds of grain mixture required to produce a pound of gain, 5.52.

Financial Results.

Taking the sixty cooped and uncooped birds together and considering the gains in flesh, and the cost of the food used, enables us to form opinions as to the advisability of selling chickens from the range when in growing condition, or specially preparing them for higher priced markets.

If these birds had been dressed without fattening at the commencement of the feeding test, and had shrunk the same per cent that they did when slaughtered, they would have yielded 165.5 pounds of dressed meat worth at 13 cents per pound, $21.51. At the close of the test they dressed 272.7 pounds and were sold at 15 cents per pound net, yielding $40.90. This shows that their value was increased by fattening $19.39. The increase was probably more than this amount as we found in other tests that the percentage of shrinkage in dressing lean chickens was greater than in fat ones. Thirteen cents was as much as the unfattened birds would have sold for—slowly—while the fattened ones sold quickly in the same market at fifteen cents per pound. They were very much improved in quality by fattening. The flesh was white and soft and when roasted the thighs were soft, juicy and free from strings.

The amount of the dry food used was 750 pounds and cost $7.91. The skimmed milk was 140 gallons, worth $2.80, making the total food used worth $10.71, which amount taken from the increased value of the chickens leaves a balance of $8.68 gain on the sixty birds; an average increase of a little more than 14 cents on each one above the cost of food used.

A very large proportion of the chickens raised in this State are sent to market alive, without being fattened, usually bringing to the growers from twenty-five to thirty-five cents each. These tests indicate that they can be retained and fed a few weeks in inexpensive sheds or large coops with small runs and sent to the markets as dressed meat and make good returns for the labor and care expended.

The quality of the well-covered, soft-fleshed chickens, if they are not too fat, is so much superior to the same birds not specially prepared that they will be sought for at the higher price. The dairy farmer is especially well prepared to carry on this work as he has the skimmed milk which is of the greatest importance in securing yield and quality of flesh.

EFFECTS OF AGE.

In order to compare the gains made with chickens of different ages, twenty of the same hatch that were used in the previous tests were taken for the later feeding. When the former tests were started the birds were one hundrd and thirty days old. This test was commenced when they were one hundred and seventy days old. During the time that their mates had been shut up for fattening, they had the liberty of a large yard with an abundance of green food. They had been fed mash in the morning and mixed grain and cracked corn at noon and night. They had been growing bone and muscle but were not meaty. Twenty of them were put in the small coops—four in each one—and fed from the same meal and milk mixture that was used in the previous tests. When the experiment began, October 11th, they weighed 100.2 pounds. They were fed twenty-one days and then weighed 117.5 pounds having gained 17.5 pounds, an average to each bird of .87 pounds. They consumed 144 pounds of the dry meal and the same relative amount of milk as in the earlier test. 8.2 pounds of the mixed meal was required to make a pound of live chicken. With the confined young birds in the previous test but 5.94 pounds of food were required to yield a similar amount. The gain per bird of .87 pounds was markedly less than that of the younger birds of 1.48 pounds during the first twenty-one days of their test.

When these chickens were put in the small coops twenty-five of their mates of the same hatch were put in a house nine by eleven feet with a yard twenty feet square, and fed twice a day on the same mixture of meal and milk. None of the birds received green food. During the twenty-one days they gained 23.2 pounds, an average per bird of .92 pounds, while in the previous test with the young yarded chickens, the average gain during the first twenty-one days was 1.59 pounds.

This decreased gain in the case of the older chickens corresponds with the recognized law in animal feeding, that the younger the creature is the less the quantity of food required to produce a pound of growth. For the moderate difference (6 weeks) in the ages of the two lots of chickens this variation in the amounts of food required to produce a pound of gain seems extravagant, but when it is considered how rapidly chickens mature it is not unreasonable. The practice of successful poultrymen in selling the cockerels at the earliest marketable age is well founded, for the spring chicken sold at Thanksgiving time is an expensive product.

The average live weights of the two lots at slaughtering was very nearly alike, viz. 5.88 pounds for the younger and 5.83 pounds for the older ones. The young ones were better in appearance, being thicker meated and softer, while the older ones showed a trifle more bone and a little harder flesh.

The details of the test are given in the tables which follow.

CHICKENS CLOSELY CONFINED IN COOPS AND FED TWENTY-ONE DAYS.

AGE OF CHICKENS AT COMMENCEMENT OF TEST—177 DAYS.

Coop.	Chickens.	Live Weights During Experiment.						Dressed.
		Oct. 11.	Oct. 18.	Oct. 25.	Nov. 1.	Increase. Lot.	Increase. Each.	
1	Four Plymouth Rocks	18.5	20.5	21.0	22.0	3.5	.87	17.4
2	Four Plymouth Rocks	20.2	21.4	22.6	24.4	4.2	1.05	19.3
3	Four Plymouth Rocks	20.8	22.4	22.8	23.5	2.7	.67	19.0
4	Four Plymouth Rocks	18.7	20.4	21.0	22.4	3.7	.94	18.6
5	Four Plymouth Rocks	22.0	23.3	25.2	25.4	3.4	.85	19.3
	Total weight	100.2	108.0	112.6	117.7	......	......	93.6
	Increase in weight	....	7.8	4.6	5.1	17.5	.87	......

Pounds of grain mixture required to produce a pound of gain, 8.2.

TWENTY-FIVE PLYMOUTH ROCK CHICKENS CONFINED IN HOUSE AND SMALL YARD AND FED TWENTY-ONE DAYS.

AGE OF CHICKENS AT COMMENCEMENT OF TEST—177 DAYS.

Live Weight.				Total dressed weights.
October 11.	November 1.	Increase in weight. Total.	Increase in weight. Each.	
Lbs. 121.7	Lbs. 144.9	Lbs. 23.2	Lbs. .92	Lbs. 115.2

Pounds of grain mixture required to produce a pound of gain, 7.63.

Financial Results.

The forty-five birds weighed 221.9 pounds at the beginning of the test. If they had been dressed at that time and had shrunk at the same rate as they did when they were slaughtered they would have yielded about 177 pounds of dressed meat, worth at thirteen cents a pound $23.01. They ate 321 pounds of mixed meal costing $3.40, and 60 gallons skimmed milk worth $1.20, altogether $4.60, which taken from the increased value of the chickens leaves $3.71 as the net gain,—not accounting for labor—or an average of 8.25 cents for each chicken.

Although the chickens employed in this test had been growing during the five weeks in which their mates in the first test had been undergoing fattening, they had not improved in condition sufficiently to sell at a better price per pound than at the commencement of the first test.

THE EFFECT OF GREEN FOOD.

To study the effect of green food in fattening chickens, the following trial was made with twenty-four pure-blooded Plymouth Rock chickens that were one hundred and forty days old at the commencement of the test. They were confined in the small coops, described on page 89, four in each coop, and all fed for four weeks on the mixed meal and milk porridge twice each day.

The birds in coops 1 and 2 received no green food. Those in coops 3, 4, 5, and 6 received no green food during the first and second weeks, but during the third and fourth weeks they were given all the finely chopped green rape they would eat once a day. They did not consume as much of the rape per day as they had previously while living in the large yards, where they ate it voraciously. The quantity of porridge eaten by them was not noticeably greater or less when the rape was supplied. The gains made while the birds were supplied with green food were hardly as great as while confined to the porridge alone, but the difference was not very great.

The following table gives the details of the experiment.

TWENTY-FOUR PLYMOUTH ROCK CHICKENS FED TWENTY-EIGHT DAYS WITH AND WITHOUT GREEN FOOD.

LIVE WEIGHTS DURING EXPERIMENT.

Coop.	Feed.	Beginning.	End of first week.	End of second week.	End of third week.	End of fourth week.	INCREASE.	
							First and second weeks.	Third and fourth weeks.
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
1	No rape	14.1	16.	18.2	20.3	22.6	4.1	4.4
2	No rape	15.7	17.8	19.5	21.8	23.6	3.8	4.1
3	No rape	15.4	17.6	19.4	-	-	4.0	-
3	Rape................	-	-	-	2.01	22.6	-	3.2
4	No rape	14.6	16.9	18.9	-	-	4.3	-
4	Rape..................	-	-	-	20.4	22.7	-	3.8
5	No rape...............	13.8	15.4	17.5	-	-	3.7	-
5	Rape.	-	-	-	18.9	21.0	-	3.5
6	No rape	15.8	17.8	19.7	-	-	3.9	-
6	Rape..................	-	-	-	21.5	23.4	-	3.7

Were it not for the check coops 1 and 2, the query might arise whether there might not be diminished gains from prolonged confinement during the 3d and 4th weeks. Coops 1 and 2 received no green food at any time, and their gains were a little better during the last than the first weeks. Although from experience we are persuaded of the value and even necessity of a free supply of green food for young growing chickens and breeding fowls, in this short period with rations composed so largely of milk, the growth was quite as satisfactory without an accompaniment of green food.

BREEDING FOR EGG PRODUCTION.

G. M. GOWELL.

For several years the Station has been breeding with the hope of establishing families or strains of hens that shall excel as egg producers. It is known that the laws of inheritance and transmission are as true with birds as with cattle, sheep and horses, and when we consider the wonderful advance in egg production that the hen has made since domestication, there is ample reason for assuming that a higher average production than the present can be secured by breeding only to birds that are themselves large producers. It was found in practice that with the most careful selection we were including in our breeding pens birds that were not great producers, and that it was a prime necessity to ascertain the exact record of the eggs produced by each individual. This led to devising the trap nest described in the report of this Station for 1898.*

This work, as undertaken, of breeding for more and better eggs will of necessity require much time, and several years will probably elapse before marked results may be looked for.

At this time cockerels are being raised from the hens that gave over two hundred eggs last year for our breeding next season. Among the two hundred additional hens undergoing test this year, it is hoped to find other large yielders and that next year we may have some pens where both the males and females will be from large producing dams. The three breeds taken for this work are kept separate and pure.

The first year's work in this selection of stock is here reported as a matter of record and not because definite results have yet been obtained.

Pure bred birds from three breeds were used, viz., Barred Plymouth Rocks, White Wyandottes, and the Eaton Strain of Light Brahmas. Two hundred and sixty April and May hatched pullets were put into breeding pens, November 1, 1898, and records kept of their individual productions for a year. The purpose was to save those with yearly yields of one hundred and sixty eggs and over, and those with yields of one hundred or less, so as to see what variations there were in the individuals comprised in the flocks. As the room was needed for other birds on October 10th, 1899, some of the hens that had not sufficient time remaining in which to reach a yield of one hundred and sixty eggs in the year since commencing to lay, and that had produced one hundred eggs within the year were taken out of the test, consequently the average yield of all the hens for the full year cannot be given.

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*A reprint of the paper describing the trap nest will be sent on application.

Of the two hundred and sixty hens put into the test, five died during the year and nineteen were stolen. Of the two hundred and thirty-six remaining, thirty-nine each laid one hundred and sixty or more eggs and thirty-five laid less than one hundred each. Twenty-four of the one hundred and twenty-six Plymouth Rocks laid one hundred and sixty or more eggs each, and twenty-two laid less than one hundred each. Nine of the fifty-six Wyandottes each laid more than one hundred and sixty eggs and seven laid less than one hundred each. Six of the fifty-four Light Brahmas each laid more than one hundred and sixty eggs and six laid less than one hundred each. All birds were put into the test November first at which time some of the earliest ones had been laying for about two weeks. The year commenced November first for all birds that laid during that month. Some of the later hatched ones did not commence to lay until January and February and they were given a full year after they commenced.

The monthly records of the hens that laid more than 160 or less than 100 eggs in the first 12 months after they began laying follow.

EGG RECORDS OF HENS HATCHED IN 1898 WHICH LAID MORE THAN 160 OR LESS THAN 100 EGGS IN THE FIRST 12 MONTHS AFTER THEY BEGAN LAYING.

FROM 126 BARRED PLYMOUTH ROCKS.

Number of the hen.	1898.		1899.												Total.
	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	
286.....	....	.....	.....	14	23	15	18	24	25	23	26	23	1	.. .	*206
101......	.....	. ..	18	15	21	21	24	21	17	26	17	21	3	.....	204
36.....	. . .	15	9	23	23	19	16	21	19	13	15	8	20	.....	201
51......	....	7	14	14	20	17	16	24	24	22	18	15	.....	.....	191
7......	19	11	19	19	23	16	16	14	14	17	21	.....	....	.....	189
120......	.....	.....	17	20	17	13	15	18	24	20	22	18	4	.....	188
74......	....	5	18	18	21	14	18	16	15	15	7	18	17	.....	182
70	.....	8	24	19	21	17	13	16	17	19	19	6	2	.....	181
126......	. . ..	.....	11	12	21	19	18	20	14	11	15	11	14	14	180
10......	16	14	5	20	23	19	19	18	17	10	14	.....	....	.. ..	175
31	6	5	9	22	23	20	20	18	19	16	9	8	.....	.....	175
159......	.....	. ...	4	25	9	13	13	14	14	12	15	18	20	18	175
300......	.....	....	.....	19	18	11	17	14	13	17	8	21	20	17	175
289......	.....	.....	.....	8	22	20	17	19	12	20	12	21	14	7	172
76......	.....	. ...	15	20	18	18	22	19	24	19	14	.....	.....	.....	169
45... .	....	17	22	19	22	17	15	14	13	11	7	9	13	1	166
205.....	.....	....	.....	.....	....	.....	.....	22	19	19	15	.....	.....	.....	166
30	7	7	18	16	19	19	19	20	22	8	8	2	... .	.. ..	165
209......	.....	....	2	20	20	18	18	13	17	17	12	17	10	.....	164
40......	3	6	5	20	17	12	14	20	20	24	18	3	.....	.....	162
6	18	12	7	15	18	16	15	8	14	6	12	20	. ..	.....	161
117......	....	....	10	2	20	24	17	19	23	25	20	1	.....	.....	161
80......	.....	. ..	16	22	15	7	17	17	15	9	10	12	15	5	160
154... .	....	.....	5	12	20	21	22	22	18	21	18	1	.....	.....	160
89......	....	. ...	13	13	16	8	15	16	14	3	.....	....	....	.....	98
184.....	.....	.....	.....	9	19	17	22	17	....	6	6	1	.....	.....	97
21......	10	16	7	16	.....	10	9	12	12	4	.....	.....	.....	.....	96
42	2	10	.....	13	6	8	12	15	11	8	5	.....	....	.....	90
157......	.....	.....	. ...	19	13	12	8	11	15	4	6	1	.....	.....	89
60.....	.....	1	4	6	15	12	9	6	12	15	8	.....	.....	. ...	88

*No. 286 was a late hatched pullet and did not begin laying until Feb. 12. To give her a full year she received credit for 14 eggs laid in January, 1900.

EGG RECORDS OF HENS—CONTINUED.

Number of the hen.	1898.		1899.												Total.
	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	
95	.....	3	19	8	10	9	11	4	11	6	5	.....	.....	.....	86
72	2	13	11	8	2	8	15	7	3	11	.....	.....	.....	.....	80
58	.....	1	18	16	15	3	11	6	5	4	.....	.....	.....	.....	79
183	.....	.....	.....	2	26	7	15	12	13	1	.....	.....	.....	.....	76
258	.....	.....	.....	2	21	7	2	9	10	4	20	1	.....	.....	76
264	.....	.....	.....	5	16	9	12	14	15	2	.....	.....	.....	.....	73
233	.....	.....	.....	14	19	6	13	10	9	.....	.....	.....	.....	.....	71
239	.....	.....	.....	13	21	.....	14	5	5	8	.....	.....	.....	.....	66
207	.....	.....	2	20	7	11	9	1	7	4	3	.....	.....	.....	64
176	.....	.....	.....	12	10	.....	11	14	6	.....	.....	.....	.....	.....	53
41	.....	16	3	.....	.....	.....	.....	19	8	6	.....	.....	.....	.....	52
256	.....	.....	.....	1	18	8	3	11	12	3	1	.....	.....	.....	47
254	.....	.....	.....	3	7	4	14	9	8	.....	.....	.....	.....	.....	45
236	.....	.....	.....	1	18	4	10	.....	5	.....	.....	.....	.....	.....	38
162	.....	.....	9	9	8	2	3	5	1	.....	.....	.....	.....	.....	37
234	.....	.....	.....	9	17	.....	6	4	.....	.....	.....	.....	.....	.....	36
FROM 56 WHITE WYANDOTTES.															
14	21	20	24	21	19	17	10	18	14	16	15	13	.....	.....	208
4	20	.....	19	16	22	13	19	22	15	21	19	15	.....	.....	201
47	.....	12	19	18	19	16	19	17	19	15	14	16	16	.....	200
8	14	17	13	14	18	17	15	11	12	14	15	10	.....	.....	170
280	.....	.....	.....	5	1	13	23	18	21	15	21	21	17	15	170
242	.....	.....	.....	15	24	13	16	16	17	14	12	14	12	14	167
203	.....	.....	2	21	17	16	10	15	16	15	13	14	13	14	166
134	.....	.....	9	16	16	17	14	16	14	10	15	6	16	16	165
215	.....	.....	1	17	19	8	21	13	17	18	22	12	11	6	165
108	.....	.....	16	22	15	13	14	9	.....	.....	.....	.....	.....	.....	89
18	9	.....	3	18	10	12	5	15	8	.....	.....	.....	.....	.....	80
79	.....	.....	13	18	14	10	11	8	5	.....	.....	.....	.....	.....	79
158	.....	.....	.....	21	5	13	.....	15	7	9	6	2	.....	.....	78
255	.....	.....	.....	3	18	14	11	20	8	.....	.....	.....	.....	.....	74
267	.....	.....	.....	12	21	6	14	18	2	.....	.....	.....	.....	.....	63
170	.....	.....	3	10	11	7	8	11	9	.....	.....	.....	.....	.....	59

EGG RECORDS OF HENS—CONCLUDED.

FROM 56 LIGHT BRAHMAS.

Number of the hen.	1898.		1899.												Total.
	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	
52......	.....	11	19	20	21	20	19	20	21	18	19	1	5	....	194
139.....	.....	.....	11	20	19	14	21	19	21	21	22	20	.....	6	194
61......	.....	4	12	18	21	16	14	21	19	15	16	16	18	.....	190
43.....	.....	5	18	21	21	14	19	22	18	19	21	3	.....	.....	181
292......	.....	....	.....	21	22	12	17	16	15	16	16	13	13	20	181
50.....	.....	17	19	20	17	19	14	14	13	10	13	5	18	...	179
296	.....	.....	.....	18	16	6	6	14	10	5	8	4	.....	.....	87
198......	.....	.....	.....	10	14	17	1	14	15	8	2	5	.....	.....	86
243......	.....	.....	.....	3	10	10	16	18	3	7	8	.....	.....	....	75
227......	.....	.....	.....	6	24	8	7	8	6	.....	....	....	.....	.....	59
55......	....	....	.....	6	11	9	3	10	7	8	1	.....	.....	.....	55

A study of the monthly record sheets shows great differences in the capacities of hens, and marked variations in the regularity of their work; some commencing early and continuing laying heavily and regularly month after month while others varied much, laying well one month or poorly or not at all the next.

It is impossible to account for these vagaries as the birds in each breed were bred alike and selected for their uniformity. All pens were of the same size and shape and contained the same number of birds. Their feeding and treatment were alike throughout. Whenever changes were made in the feed in one pen, they were made in the others. That they were in good health is shown by the fact that but two were ailing, and were taken out early; two crop bound; and one injured by rough treatment by a cockerel. Many of the lightest layers gave evidence of much vitality and in many instances there were no marked indications in form or type by which we were able to account for the small amount of work performed by them. Numbers 234, 70 and 236 yielded respectively 36, 37 and 38 eggs in the year. They were of the egg type and gave no evidence of weakness or masculinity.

Number 101, 286, 36, 47 and 14, with their yields of 204, 206, 201, 200 and 208 eggs during the year, were typical birds with every indication of capacity, but they were equaled in appearance, in the minds of good judges, by other birds that yielded a much less number of eggs.

The size and uniformity of the eggs yielded are of a good deal of importance. It was very noticeable in these investigations that the eggs from hens that laid the greatest numbers averaged smaller in size than those from hens that did not produce so many. That this is not always the case is shown by the eggs from numbers 101 and 286 which were of good size and dark brown, while those from number 36 were small and lacking in color. For this defect number 36 has been excluded from the breeding pens.

Number 14 is a good, large, strong White Wyandotte and because of the quantity and quality of her productions she is a phenomenal bird. When she went into the test November 1st, 1898, she had been laying for over two weeks. At the end of the year she had two hundred and eight good brown eggs to her credit, and she still kept on, laying 18 eggs in November, 22 in December, 21 in January, 18 in February, 15 in March and 18 in April (just closed) giving her 112 in the first six months of her second year, and 320 in eighteen months, a little more than an egg in a day and three-fourths for the entire year and a half after she commenced laying.

When the eggs from the hens that had been laying long and freely were placed in incubation, many of them were found low in fertility, or entirely sterile, notwithstanding the hens had mated freely with vigorous cockerels. The percentage of infertility was much greater than in eggs from hens that had been laying moderately. The question arises whether a large percentage of the chickens raised each year are not the produce of the tardy and moderate layers that are comparatively fresh, rather than of the more valuable and persistent layers that have been hard at work all winter? If this is so, breeding from eggs as they are ordinarily collected, without a knowledge of the hens that produce them, can but tend to furnish a large proportion of chickens from the poorest hens in the flocks. The cockerels as well as the pullets raised in this way furnish the breeding stock for the next year and in this manner the reproduction of the poorer rather than the better birds is fostered.